US 20220139129A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2022/0139129 A1

LERNER et al. (43) Pub. Date: May 5, 2022

(54) SYSTEM FOR PREVENTING VEHICLE KEY FOB RELAY ATTACKS

(71) Applicant: **FORD GLOBAL TECHNOLOGIES, LLC**, Dearborn, MI (US)

(72) Inventors: **Jeremy LERNER**, Southfield, MI (US); **Jochen SCHUBERT**, Royal Oak, MI (US); **Scott HUGGINS**, Novi, MI (US)

(73) Assignee: **FORD GLOBAL TECHNOLOGIES, LLC**, Dearborn, MI (US)

(21) Appl. No.: **17/083,518**

(22) Filed: **Oct. 29, 2020**

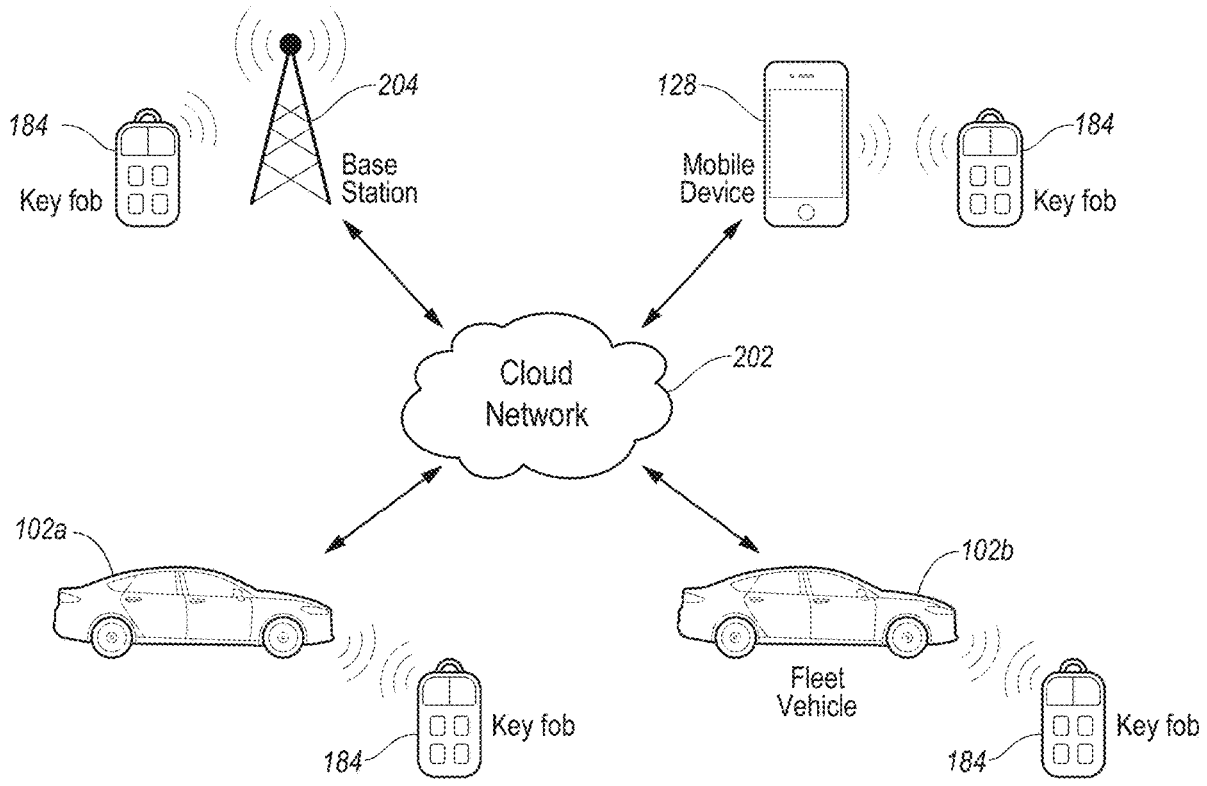
Publication Classification

(51) **Int. Cl.**
G07C 9/00 (2006.01)

(52) **U.S. Cl.**
CPC ***G07C 9/00174*** (2013.01); *G07C 2009/00984* (2013.01); *G07C 2009/00555* (2013.01)

(57) **ABSTRACT**

A vehicle subscribed to an authentication system includes a wireless transceiver; and a controller, configured to responsive to receiving a wireless signal from a device identified as a key fob via the wireless transceiver, obtain history data reflecting time and location of the key fob associated with the vehicle detected via one or more entities subscribed to the authentication system, calculate a sanity value using the history data, such that a distant detection location from the vehicle location at a time before present time results in a lesser sanity value and a nearby detection location from the vehicle location at substantially the same time before the present time results in a greater sanity value, calculate a sanity threshold using at least one of the present time and the vehicle location, and responsive to the sanity value being greater than the sanity threshold, unlock a door of the vehicle.



200